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EXAMINER

HIRUY, ELIAS

ART UNIT PAPER NUMBER

2837

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/747,889

Applicant(s)

HEO, JEA SUNG

Examiner

Elias B. Hiruy

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-11 and 13-18 is/are rejected.
- 7) ☐ Claim(s) 4, 5, 7 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/29/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Bell U.S. Patent No. 5,057,754.

Referring to claim 1, Bell discloses a system and an apparatus for controlling a windshield wiper as claimed (see figures 6A and 6B and respective portion of the specification). Bell discloses in figure 6A and 6B, a moisture sensor (i.e. rain droplet detector) (60), multiplexer (56), drop accumulation counter (i.e. count register) (64), and motor drive logic (i.e. wiper control unit).

The moisture sensors in Bell invention are configured as switches that have a plurality of conductors and will be conducting upon a raindrop (Col. 5 lines 22-34). In the embodiment of figure 1b, the sensors, with the aid of a drop discriminator, have two states (or signal types) of output, logic "0" or "1" (Col. 5 line 51-56). The multiplexer of Bell invention is configured to scan, select, and output a corresponding signal based on the received input from the selected sensors (Col. 7 line 35-53). Further, the drop accumulation counter (i.e. count register) performs in like manner of the count register of this application. The drop accumulation counter counts the signal that was inputted

Art Unit: 2837

from the multiplexer and outputs a counted value (Col. 8 line 15-25). The motor drive logic (i.e. wiper control unit) receives the output of the count register and controls the wiper motor.

Regarding claims 2 and 3, Bell shows a system where the clock signal is feed to the multiplexer as a binary signal and where the multiplexer outputs a sequential signal based on the binary clock signal received (Col. 7 lines 35-54). Bells teaching show that the multiplexer uses this binary clock signal to select the input from one of the sensors.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bell U.S. Patent No. 5,057,754 as applied to claim 1 above, and further in view of Klug et al U.S. Patent 6,690,130 B2.

Bell teaches about a system and an apparatus that meets all the limitation of claim 1.

Although Bell teaches how a control unit is used to control the motor speed as a function of the rain droplets, Bells teaching does not clearly show how the control unit “determines a rain droplet amount level based on the received counted value” in like manner of this application.

Klug et al discloses a system with a control unit that is used to determine a rain droplet amount level based on the received counted value (Column 4 line 25-43). In fact, the statement is here quoted for clarity purpose:

“...[H]aving a control unit, which as an input variable processes the output signals of a rain sensor as well as the switching signals of a manually controllable switch means and **as an output variable controls a supply voltage of the electric drive motor and thus a wiper speed, and as a function of a rain quantity detected by the rain sensor (2),** the at least one wiper (8) can be operated with variable intermittent interval times and at variable wiper speeds, so that precisely one wiper speed and precisely one intermittent interval time are associated with each measured rain quantity..”

Klug et al control unit is able to determine the amount of rain level in order to activate a motor speed that is associated with it. Further, the control unit is able to control the wiper motor to run at the speed determined.

Thus, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adopt Klug et al control unit into Bell system or apparatus to effectively control the wiper motor so that associated problems such as window streaking can be fully eliminated.

3. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell U.S. Patent No. 5,057,754 as applied to claim 1 above, and further in view of Lasse Pub NO. US 2002/0003410 A1.

Bell teaches about a system and an apparatus that meets all the limitation of claim 1.

Although Bell covers briefly how a microprocessor is used to attain similar goals as claimed, Bells teaching does not in detail show how a microprocessor can achieve similar goals in like manner of this application. Further, Bell does not disclose a method that could be used to sense the speed of the vehicle, nor does the disclosure show how this information can be utilized.

However, Lasse teaches about a method and an apparatus that has a control means (8) that is configured to receive the input from the speed sensor (7) and use the information to control the vehicle wiper. The control means (8) is "designed for generating a rotational-speed command as a function of [sensors 4-7]" (Col. 2 line 13-20).

Hence, it would have been obvious for one having ordinary skill in the art at the time the invention was made to add a speed sensor, in the manner taught by Lasse, into Bell invention and use the information gained from the sensor to better control the vehicle. The motivation for adding the speed sensor being that a speed sensor provides a vital data about the vehicle speed that could be used to adjust the speed of the wiper in order to remove additional raindrops gained due to the speed of the vehicle.

Regarding claim 9, the claim is a method claim that does introduce a structural limitation to claim 8. As such, little patentable weight is given to the claim since the method does not potentially distinguish the structure nor does it alter it.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bell U.S. Patent No. 5,057,754 as applied to claim 1 above, in view of Klug et al U.S. Patent 6,690,130 B and further in view of Lasse Pub No. US 2002/0003410 A1.

Bell teaches about a system and an apparatus that meets all the limitation of claim 1.

Bell discloses how the rain amount is determined based on the number of sensors activated (Col. 7 lines 1-5). Nevertheless, Bells teaching does not clearly show how a wiper control unit determines a rain droplet amount level based on the received counted values.

Klug et al shows a system that has a wiper control unit that determines the amount of rain droplet level and controls the wiper based on the level of droplets detected (Column 4 line 25-43).

However, both Bell and Klug et al fail to discuss how the initial state of the wiper is used to determine the future control signal.

Lasse shows a system used to detect the initial state of the wiper and teach how this state can be used to control the wiper motor thus the wiper speed.

Hence, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify Bell system to incorporate a wiper control unit that determines and uses the present state of the wiper speed and amount of droplets detected to control the wiper speed. The motivation being that a wiper control unit, which is able to detect a windshield wiper initial state, can control the wiper motor with greater precision.

5. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being anticipated by Klug et al U.S. Patent 6,690,130 B2 in view of Lasse Pub No. US 2002/0003410 A1, and further in view of Buchanan, Jr. et al 6,144,906.

Barring a showing of criticality, the limitation of claim 11, which presents 9 wiper speed levels and 17 droplet amount levels, is given little patentable weight. The prosecution in this office action will proceed by considering the particular levels disclosed as no more than an optimum or workable range. Since it has been held where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

In regards to claim 11, Klug et al discloses a method that shows 9 wiper speed levels that have different wiper motor speed (Refer to the table disclosed in the publication). Further, the disclosure shows how detected amounts of rain droplets are subdivided into different ranges and levels. Klug et al invention accounts for a rain droplet amount level of 0 to 32. In addition, the droplet amount level ranges are associated with different wiper speed.

Regarding claim 13, Klug et al invention shows that, if the amount of rain droplets corresponds to the rain droplet amount level of 0, the wiper will not be operated any more (See figure 1 and associated discussion).



Although Klug et al teaches most of the essential methods as claimed in claim 11 and 13, Klug et al teaching does not clearly show how the initial wiper state is utilized in making future decisions.

However, Lassle shows a method used to detect the initial state of the wiper and teach how this state can be used to control the wiper motor thus the wiper speed.

Regarding claims 14-18, the limitations taught by this claims are a direct application of fuzzy logic. The teaching of the claims is not a novel idea, but one of which is a direct application of a well-known theory. For instance, both Klug et al and Buchanan Jr. et al demonstrate how fuzzy logic can be applied to wiper control. Buchanan Jr. et al teaches in detail how fuzzy logic can be applied to a wiper control system that is operated automatically upon the output of a rain sensor (See figure 7 and associated teaching).

Thus, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify Klug et al invention to incorporate a fuzzy logic method where the present state of the wiper speed can be detected and utilized to control the wiper speed in combination with the amount of rain droplets detected. The motivation being that the detection of the windshield wiper initial state makes it possible for the speed of the wind shield wiper to be controlled with high precision while the use of fuzzy logic aids in compensating nonlinearities in the sensor and implement intuitive reasoning for automatic operation of the wiper.

**Allowable Subject Matter**

6. Claims 4-5, 7, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. A brief discussion is presented here where the examiner found the teaching of the prior art very closely related to the present application. Please refer to the attached 892 Form for all the documents reviewed during the prosecution of this office action.

Millerd et al U.S. Patent No. 4,705,998 discloses a system that has the basic components and arrangement of this application. The invention shows sensors (made out of a pair of conductors), scanning circuit (that has multiplexers 52 and 54), and binary counter (80) that is clocked by oscillator (72).

A Fuzzy logic-based Smart Automatic windshield wiper, a Control System Magazine, IEEE publication, teaches how fuzzy logic can be applied to a wiper control system. The publication also teaches the general concepts thought in this application.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias B. Hiruy whose telephone number is 571-272-6105. The examiner can normally be reached on 7AM-4:30PM.

Art Unit: 2837

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EH  
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